

Adoption of System of Rice Intensification in a Larger Production Scale

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Keywords: System of Rice Intensification, farm management

1 Introduction

The Green Revolution of the 1960s onwards modernized and transformed agriculture forever. However, the resource-intensive agriculture that the Revolution promoted was beyond the reach of many poor farmers across the world, further marginalizing them in the process of rural development. While no effort has matched the scale or the degree of impact of the Green Revolution, many efforts have been made since to reach such marginalized farmers. One such effort in recent years is the dissemination of System of Rice Intensification (SRI)¹, a rice production method in which, ideally, more rice is produced with less resource inputs (i.e. less cost of production). Table 1 shows an example of yield increase by SRI.

While the degree of adoption has varied from one place to another, SRI has spread among farmers in developing countries, particularly in Asia and Africa, and has gained the support of national governments and major institutions such as the World Bank Institute and International Rice Research Institute.

Table 1. List of SRI Countries (from Uphoff, 2004)

Country	Average Comparison Yield (ton/ha)	Average SRI Yield (ton/ha)
Bangladesh	4.9	6.3
Cambodia	2.7	4.8
China	10.9	12.4
Cuba	4.3	7.4
Gambia	2.3	7.1
India	4.0	8.0
Indonesia	5.0	7.4
Madagascar	2.6	7.2
Sri Lanka	3.6	7.8

Merits of the SRI have gone beyond the increase in yield. For example, the author of this study visited Laotian farmers who practice SRI in July 2011, and have been told that the farmers were able to finance for the education of their children with the increased income by SRI. Additionally, the farmers were also told by the provincial government that they were promised a development of irrigation infrastructure if they adopted SRI. Despite the agronomic and social benefits of SRI, its dissemination has been limited thus

¹ According to the global SRI homepage, the four principles of SRI are: early, quick and healthy plant establishment; reduced plant density; improved soil conditions through enrichment with organic matter; and reduced and controlled water application.

far to small-scale farmers, often holding 1 ha or less.

2 Research Objective

This study aims to investigate the impact of SRI on rural development when farmers with larger management scale of production adopt the practice. When a technology intended for small-scale farmers is applied to a larger farming operation, how differently does it affect the rural development? Using the Dominican case, this study attempts to gain some insights into the role of SRI in rural development and draw some implications.

3 The Case of the Dominican Republic

The Dominican Republic is an island country located in the Caribbean, sharing its national border with Haiti in the west. Rice has been an important part of the diet in the country, and domestic production has been enough to meet the domestic demand. Its national average rice farm size is 4.3 ha, considerably larger than that of other developing countries.

In 2004, the Dominican Republic signed CAFTA-DR, a free trade agreement with the United States and several Central American countries. The expected consequence for the domestic rice sector is the influx of cheap foreign rice into the country, and an increased unemployment for those who cannot compete. In response, the country started to disseminate SRI in 2011 in order to lower the cost of rice production. While the Dominican SRI experience is still new and has only begun, it has nonetheless received a strong interest from the farmers and the disseminating institutions, and the experiments yielded positive results thus far.

4 Methodology

Because the primary interest of the Dominican Republic is to reduce the cost of rice production, cost analysis was conducted to see the impact of SRI on the production cost. Additionally, literature review and field surveys were conducted to find the characteristics of the Dominican rice sector, and analyzed how the adoption of SRI is affected by such characteristics. The author of this study visited the country from August 5 to August 16, 2012, and conducted interviews with farmers, relevant organizations, and government officials.

5 Results and Discussion

1. Cost Analysis

Because the Dominican motivation for adoption of SRI is in the reduction of production cost, an analysis was conducted to assess the impact of SRI on rice production cost. Cost structure was taken from Marte (2012), who conducted a detailed survey on cost structure for various sizes of rice farmers.

The analysis revealed that the cost of production did not decrease very much. This is because a large portion of production costs come from factors that are not affected by the adoption of SRI – only fertilizer cost was the significant production cost expected to be reduced. However, there was a significant increase in profit, even if there was no increase in yield by SRI. Further profits can be expected for the farmers if a market for SRI rice is developed in the future, providing an added-value and differentiating the rice from conventionally produced rice.

The analysis also revealed that, the larger the farm size managed by farmers, the less efficient the financial impact of SRI is. Although the principles of SRI are biologically-based, the results suggest that SRI is not scale-neutral, and that practice is more suitable for the smaller farms.

2. Characteristics of Dominican Agriculture

Table 2 shows a summary of Dominican rice production compared to developing countries and developed countries. The table shows that the Dominican rice production is more similar to developed countries than developing countries. However, while developed countries responded to scarce labor resource by mechanizing the production process, the Dominican Republic has continued to rely on manual labor. The laborers are from neighboring Haiti, who are specialized in certain tasks within the rice production process. While many farmers in other developing countries are restricted to small farm size because labor is often provided by the family members of the farmers themselves, the Dominican rice farmers are able to operate larger farm sizes because of separation of management and labor.

Cost analysis suggested that SRI is indeed effective in making farmers more competitive against cheaper foreign rice. However, the separation of decision making and labor in the Dominican agriculture suggest that benefits from SRI will be distributed unevenly among rice production players, in which the Dominican rice farmers will gain an increase in income while Haitian laborers will not have access to financial gain.

Table 2. Generalized characteristics of rice production

	Developing Countries	Dominican Republic	Developed Countries
Resource input	Low	High	High
Domestic labor resource	Abundant	Scarce	Scarce
Scale	Smaller	Larger	Larger
Yield	Low	Low	High

While inequality is expected to be increased by the adoption of SRI, this is nonetheless a complex issue.

The rice farmers and the exploited laborers are of different nationality in the Dominican Republic. Therefore, dissemination of SRI to the Dominican farmers is not a problem from a Dominican perspective, so long as the farmers are receiving the benefits. However, from a neutral perspective, this inequality may not be a desired outcome in the process of rural development.

6 Conclusion

The following conclusions were drawn from this study:

- SRI can decrease the cost of production and increase profit for the farmers. However, the efficiency of the impact is greater for smaller farm sizes, suggesting that SRI is not a scale-neutral practice.
- Because the decision makers and the laborers are completely separate and are of different nationality, financial impact of SRI benefit the decision makers but not the laborers. As a result, economic inequality between the Dominican managers and Haitian laborers may increase.
- The increase in inequality is a complex issue, in which it may not be considered a problem from a Dominican perspective, but is problematic in the eyes of the more neutral.

The Dominican case suggests that SRI is an effective means to lower the cost and make rice more competitive in the market. However, the Dominican case also reveal that SRI may unintentionally widen a pre-existing inequality, ultimately bringing some adverse impacts to an overall rural development process. In this sense, institutions disseminating SRI should carefully consider who the beneficiaries are upon introducing the practice.

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